Pioneering for You

Wilo-TOP-Z

ErP READY — APPLIES TO EUROPEAN DIRECTIVE FOR ENERGY RELATED PRODUCTS

de Einbau- und Betriebsanleitung
en Installation and operating instructions
fr Notice de montage et de mise en service
nl Inbouw- en bedieningsvoorschriften
es Instrucciones de instalación y funcionamiento
it Istruzioni di montaggio, uso e manutenzione
pt Manual de Instalação e funcionamento
el Οδηγίες εγκατάστασης και λειτουργίας
tr Montaj ve kullanma kılavuzu

2 189 535-Ed.01 / 2017-03-Wilo

Fig. 1:

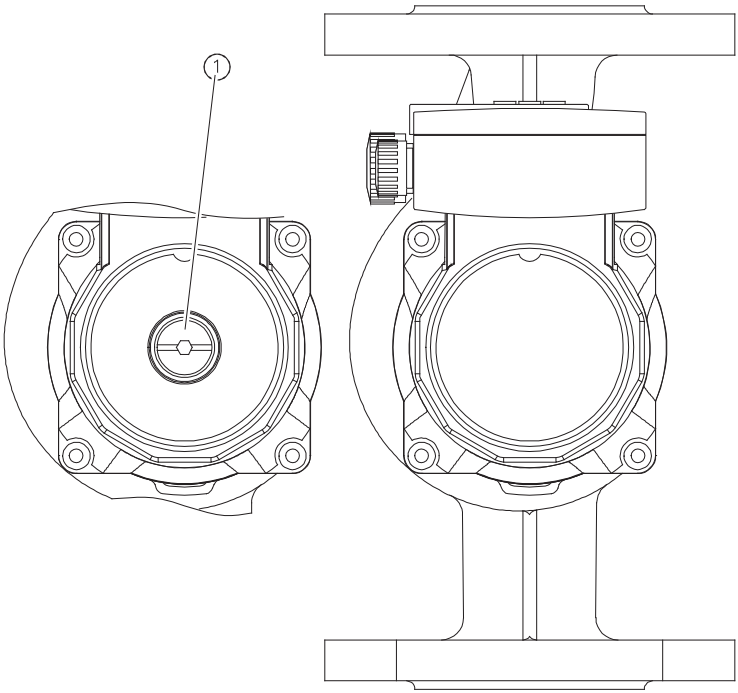
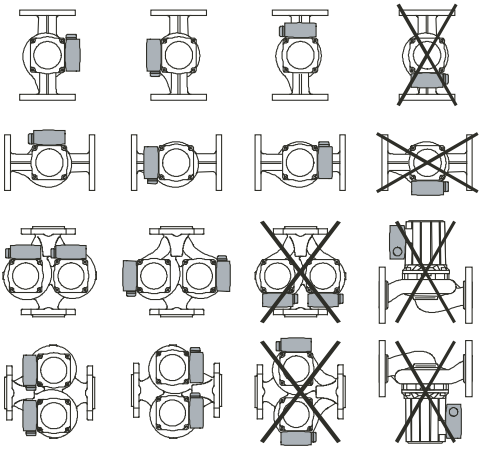


Fig. 2:



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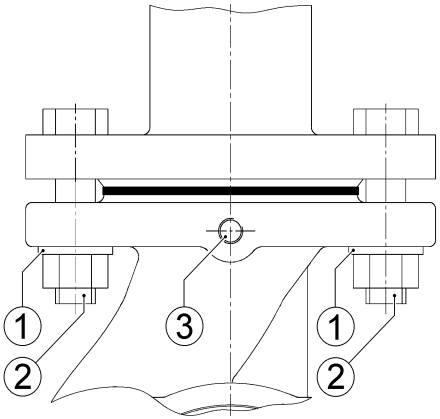
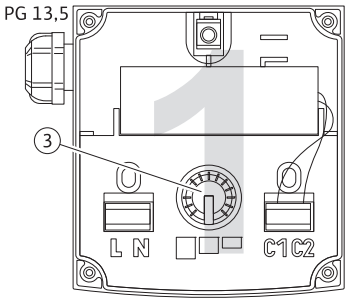
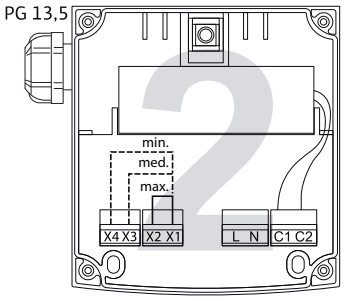
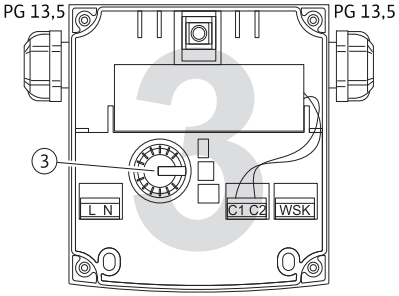
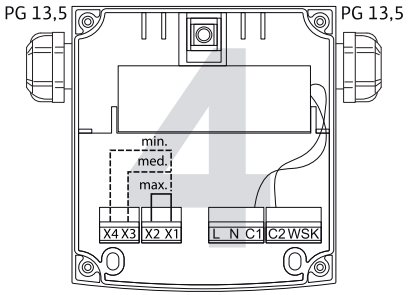


Fig. 4: 1~


PG 13,5
1
3
L N
C1 C2


PG 13,5
2
min.
med.
max.
X4 X3
X2 X1
L N
C1 C2


PG 13,5
PG 13,5
3
3
L N
C1 C2
WSK


PG 13,5
PG 13,5
4
min.
med.
max.
X4 X3
X2 X1
L N C1
C2 WSK

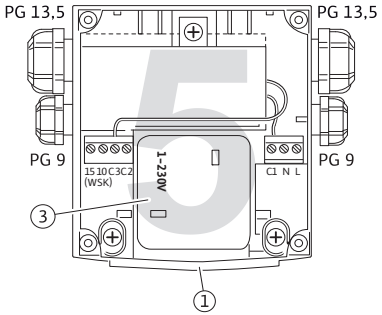
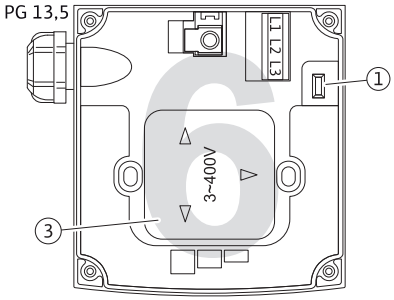

PG 13,5
PG 13,5
5
PG 9
PG 9
15 10 C3 C2
(WSK)
1~230V
C1 N L
3
1

Fig. 4: 3~


PG 13,5
6
L1 L2 L3
1
3
3~400V

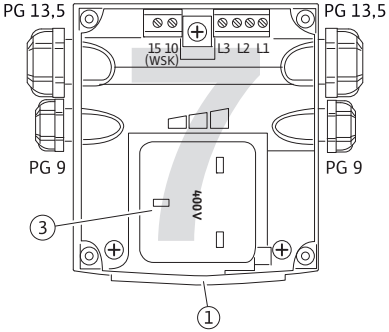
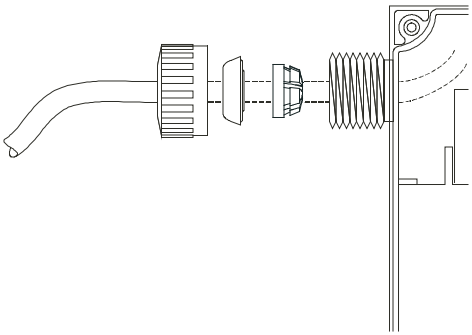

PG 13,5
PG 13,5
7
15 10
(WSK)
L3 L2 L1
PG 9
PG 9
400V
3
1

Fig. 5:



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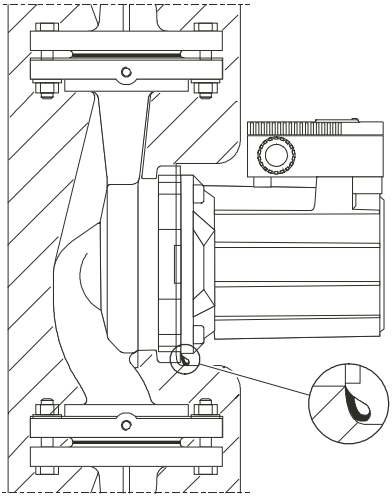
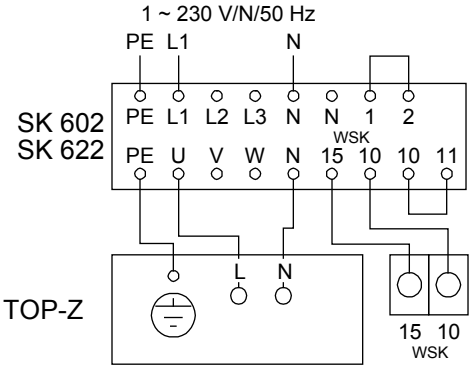


Fig. 7a:



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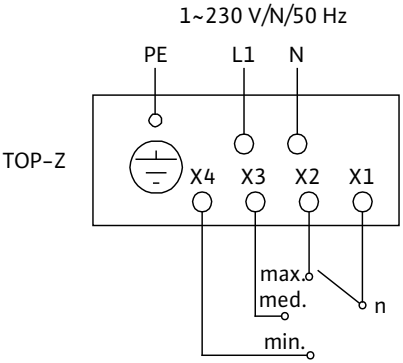

1 General information

About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for properly using and correctly operating the product. These installation and operating instructions correspond to the relevant version of the product and the underlying safety standards valid at the time of going to print.

EC-Declaration of conformity:

A copy of the EC-Declaration of conformity is a component of these installation and operating instructions. If a technical modification is made without our agreement to the designs named in the declaration or the declarations made in the installation and operating instructions on product/personnel safety are not observed, this declaration loses its validity.

2 Safety

These installation and operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these installation and operating instructions must, without fail, be read by the service technician and the responsible qualified personnel/operator before installation and commissioning.

It is not only the general safety instructions listed under the main point “safety” that must be adhered to but also the special safety instructions that are marked by danger symbols and included under the following main points.

2.1 Symbols and signal words in the installation and operating instructions

Symbols:

General danger symbol

Danger due to electrical voltage

USEFUL INFORMATION:

Signal words:

DANGER!
Acutely dangerous situation.
Non-observance results in death or the most serious of injuries.

WARNING!
The user can suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is probable if this information is disregarded.

CAUTION!
There is a risk of damaging the product/unit. 'Caution' implies that damage to the product is likely if this information is disregarded.

NOTICE: Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as
- direction of rotation arrow, direction of flow symbol
- identification for connections
- rating plate
- warning sticker
must be strictly complied with and ensured readable.

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be carried out, if necessary, by the product manufacturer at the request of the operator.

2.3 Danger in not observing the safety instructions

Non-observance of the safety instructions can result in the risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions leads to loss of any claims to damages.
In particular, non-observance can, for example, result in the following risks:
- danger to persons due to electrical, mechanical and bacteriological factors,
- damage to the environment due to leakage of hazardous materials,
- material damage,
- failure of important product/unit functions,
- failure of required maintenance and repair procedures.

2.4 Safety consciousness on the job

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be followed.

2.5 Safety instructions for the operator

This device can be used by children from 8 years of age as well as people with reduced physical, sensory or mental capacities or lack of experience and knowledge if they are supervised or instructed in the safe use of the device and they understand the dangers that can occur. Children are not allowed to play with the device. Cleaning and user maintenance is not allowed to be carried out by children without supervision.

- If hot or cold components on the product/unit lead to hazards, local measures must be taken to prevent them from being touched.
- Guards for moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages of hazardous fluids (e.g. explosive, toxic or hot) must be removed so that no danger occurs to persons or the environment. National statutory provisions are to be complied with.
- Highly flammable materials should always to be kept at a safe distance from the product.
- Danger from electrical current must be eliminated. Local directives or general directives (e.g. IEC, VDE etc.) and instructions from local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel who have sufficiently familiarised themselves with the installation and operating instructions by studying them in detail.

Work on the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the installation and operating instructions for shutting down the product/unit be complied with.

Immediately upon completing work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and make void the manufacturer's declarations regarding safety.

Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve the manufacturer of liability for ensuing consequences.

2.8 Improper use

The operational reliability of the supplied product is only guaranteed when used properly in accordance with sections 4 and 5 of the installation and operating instructions. The limit values must on no account fall below or exceed those values specified in the catalogue/data sheet.

3 Transport and temporary storage

On arrival, immediately check the product and its packaging for damage in transit. If damage from transit is identified, the necessary steps must be taken involving the carrier within the specified period.

CAUTION! Risk of personal injury and material damage!
Incorrect transport and temporary storage can cause damage to the product and personal injury.

- **The pump and its packaging must be protected against moisture, frost and mechanical damage during transport and temporary storage.**
- **Dry pump thoroughly following use (e.g. function test) and store for a maximum of 6 months.**
- **Packaging that has been sodden loses its strength and can cause injury to persons if the product falls out.**
- **The pump may be carried only by the motor/pump housing for transporting, but never by the module/terminal box, cables or external capacitor.**
- **Dirt and contamination should be avoided once the product is removed from its packaging.**

4 Intended use

The circulators may only be used for pumping liquids in domestic hot water circulation systems.

5 Product information

5.1 Type key

Example: TOP-Z 20/4 EM	
TOP	Circulator, glandless pump
Z	-Z = Single pump for domestic hot water circulation systems
20	Screwed connection [mm]: 20 (Rp ¾), 25 (Rp 1), 30 (Rp 1¼) Flange connection: DN 40, 50, 65, 80 Combination flange (PN 6/10): DN 32, 40, 50, 65
/4	Maximum delivery head in [m] for Q = 0 m^3/h
EM	EM = Single-phase motor DM = Three-phase motor

5.2 Technical data	
Max. volume flow	Depends on the pump type (see catalogue)
Max. delivery head	Depends on the pump type (see catalogue)
Speed	Depends on the pump type (see catalogue)

5.2 Technical data	
Mains voltage	1~ 230 V in accordance with DIN IEC 60038 3~ 400 V in accordance with DIN IEC 60038 3~ 230 V in accordance with DIN IEC 60038 (optionally with switching plug) For other voltages see rating plate
Rated current	See rating plate
Frequency	See rating plate (50 Hz)
Insulation class	See rating plate
Protection class	See rating plate
Power consumption P_1	See rating plate
Nominal diameters	See type key
Connection flange	See type key
Pump weight	Depends on the pump type (see catalogue)
Permissible ambient temperature	–20 °C to +40 °C
Max. rel. humidity	≤ 95 %
Approved fluids	Drinking water and water for food companies according to EC Drinking Water Directive. The choice of material of the pumps corresponds to the state of the art by taking into account the guidelines of the German Federal Environmental Agency (UBA), as stated in the German Drinking Water Ordinance (TrinkwV) Chemical disinfectants can cause damage to materials.
Permissible fluid temperature	Drinking water: up to 20°d: max. +80 °C (for short period (2 h): +110 °C) **Exception:** TOP-Z 20/4 and 25/6: up to 18°d: max. +65 °C (for short period (2 h): +80 °C)
Max. permissible Operating pressure	See rating plate
Emission sound-pressure level	< 50 dB(A) (depending on the pump type)
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2

CAUTION! Risk of personal injury and material damage!
Non-approved fluids can damage the pump and also cause injury.
Comply strictly with the relevant safety data sheets and manufacturer specifications!

Minimum inlet pressure (above atmospheric pressure) at the pump suction port in order to avoid cavitation noises (at fluids temperature T_{Med}):

T_{med}	Rp ¾	Rp 1	Rp 1¼	DN 40	DN 50	DN 65	DN 80
+50 °C	0.5 bar				0.8 bar		
+80 °C	0.8 bar				1.0 bar		
+110 °C	2.0 bar				3.0 bar		

The values apply up to 300 m above sea level; addition for higher locations: 0.01 bar/100 m increase in height.

5.3 Scope of delivery

- Pump complete
  - 2 gaskets for threaded connection
  - Two-piece thermal insulation shell
  - 8 pcs M12 washers
    (for M12 flange screws on combination flange version DN 40 – DN 65)
  - 8 pcs M16 washers
    (for M16 flange screws on combination flange version DN 40 – DN 65)
  - Installation and operating instructions

5.4 Accessories

Accessories must be ordered separately:

- Switching plug for 3 ~ 230 V
  See catalogue for detailed list.

6 Description and function

6.1 Description of the pump

The pump is fitted with a glandless pump motor (single-phase current (1~) or three-phase current (3~), **for mains connection voltage and mains frequency see the rating plate**, in which all the rotating parts are in contact with the fluid. The design relies on the fluid to provide lubrication for the plain bearings of the rotor shaft.

The motor is multi-speed. Speed switching is executed in different ways depending on the terminal box. The ways are either by a speed selection switch, by plugging in the switching plug differently or by an internal or external bridging of the contacts. (see commissioning/speed change-over).

A suitable switching plug is available as an accessory for 3~ 230 V.

The assignment of terminal boxes to the individual pump types is described in the section "Terminal boxes" (section 6.2).

The pumps from this series are specifically matched with the operating conditions in domestic hot water circulation systems (see also DIN 50930-6/TrinkwV (German Drinking Water Ordinance) in Germany) in terms of the choice of mate-

rial (pump housing made from red brass) and design conformity with the relevant regulations (TrinkwV., ACS, WRAS, W3d, guidelines for creating potable water installations).
If pumps of the series Wilo-TOP-Z in EN-GJL (pump housing of grey cast iron) are used in domestic hot water circulation systems, the national regulations and guidelines should be complied with as necessary.

6.2 Terminal boxes

There are seven terminal boxes (Fig. 4) for all pump types, which are assigned, as per table 1, to the pump types:

Mains connection	max. power consumption P_1 (see rating plate data)	Terminal box type TOP-Z
1~	95 W ≤ P_1max ≤ 205 W	1/2
	295 W ≤ P_1max ≤ 345 W	3/4/5
3~	95 W ≤ P_1max ≤ 215 W	6
	305 W ≤ P_1max ≤ 1445 W	7

Table 1: Assignment of terminal box types to pump types (see also Fig. 4)

The fittings for the terminal boxes can be found in Table 2:

Terminal box type	Direction of rotation signal lamp (Fig. 4, item 1)	Variable speed control (Fig. 4, item 3)
1	–	Speed selection switch, 3-step
2	–	Internal or external, Bridging of contacts “x1-x2” or “x1-x3” or “x1-x4”
3	–	Speed selection switch, 3-step
4	–	Internal or external, Bridging of contacts “x1-x2” or “x1-x3” or “x1-x4”
5	– [2]	Switching plug, 2-step
6	X (internal)	Switching plug, 3-step
7	X [1]	Switching plug, 3-step

Table 2: Fitting of terminal boxes

1) The light indicator signals are carried by a common fibre optic cable to the cover, so that the signals are visible from outside.

2) When mains voltage is present, the lamp lights up green.

- The direction of rotation signal lamp lights up green when mains voltage is present and the direction of rotation is correct; if the direction of rotation is incorrect, the control lamp goes out (see the section “Commissioning”).

7 Installation and electrical connection

DANGER! Risk of fatal injury!
Incorrect installation and improper electrical connections can be life-threatening. Danger from electrical current must be eliminated.

- **The installation and electrical connection may only be carried out by qualified personnel in accordance with the applicable regulations!**
- **Adhere to accident prevention regulations!**
- **Comply with the regulations of the local energy supply company!**

Pumps with pre-assembled cable:

- **Never pull on the pump cable.**
- **Do not bend the cable.**
- **Do not place objects on the cable.**

7.1 Installation

WARNING! Risk of injury.
Incorrect installation can result in personal injury.

- **There is a crushing hazard.**
- **There is a risk of injury due to sharp edges/burrs. Wear appropriate protective clothing (e.g. safety gloves)!**
- **There is a risk of injury caused by the pump/motor falling. Prevent the pump/motor from falling, if required, by using suitable lifting gear.**

CAUTION! Risk of material damage!
Incorrect installation can result in material damage.

- **Only use qualified personnel for installation work!**
- **Observe national and regional regulations!**
- **When the pump needs to be transported, it may be carried only by the motor/pump housing. Not by the module/terminal box!**

- Installation within a building:
  - Install the pump in a dry, well-ventilated room. Ambient temperatures below -20 °C are not permitted.
- Installation outside a building (outdoor installation):
  - Install the pump in a chamber (e.g. light well, ring chamber) with cover or in a cupboard/housing as weather protection. Ambient temperatures below -20 °C are not permitted.
  - Avoid exposure of the pump to direct sunlight.
  - Protect the pump so that the condensation drain grooves remain free from contaminants (Fig. 6).
  - Protect the pump against rain. Dripping water from above is permitted provided that the electrical connection has been established in accordance with the installation and operating instructions and properly sealed.

CAUTION! Risk of material damage!
Provide adequate ventilation/heating in situations where the permitted ambient temperature is exceeded or fallen short of.

- Carry out all welding and soldering work prior to the installation of the pump.

CAUTION! Risk of material damage!
Contamination from the pipe system can destroy the pump during operation. Before installing the pump, flush the pipe system.

- Provide shut-off devices upstream and downstream of the pump.
- Attach piping to the floor, ceiling or wall using appropriate fittings so that the pump does not bear the weight of the piping.
- When installing in the feed of open systems, the safety supply must branch off upstream of the pump (DIN EN 12828).
- If necessary remove the two half shells of the thermal insulation before installing the single pump.
- Install the pump at an easily accessible location to allow it to be easily checked or replaced at a later time.
- Precautions during installation:
  - The pump shaft should be installed free from stress and in a horizontal position (see installation positions according to Fig. 2). The motor terminal box must not point downwards. If necessary, slacken the internal hexagon head screws and rotate the motor housing (see section 9).
  - The direction of flow of the fluid must correspond to the flow direction symbol on the pump housing or the pump flange.

7.1.1 Installation of a threaded pipe union pump

- Install appropriate threaded pipe unions before installing the pump.
- Use the supplied flat gaskets between the suction/pressure ports and threaded pipe unions when installing the pump.
- Screw the union nuts onto the thread of the suction/discharge port and tighten with a suitable open-end wrench or pipe wrench.

CAUTION! Risk of material damage!
When tightening the pipe unions, keep the pump in position by gripping the motor. Not the module/terminal box!

- Check the threaded pipe unions for impermeability.
- Single pump:
  Fit the two half-shells of the thermal insulation before commissioning and push them together so that the guide pins engage in the opposing holes.

7.1.2 Installation of a flange-end pump

Assembly of pumps with a combination flange PN 6/10
(Flange-end pumps DN 40 to DN 65 inclusive)

WARNING! Risk of personal injury and material damage!
The flange connection can be damaged and develop leaks if the pump is not installed correctly. There is a risk of injury and material damage due to hot fluid escaping.

- **Never interconnect two combination flanges!**
- **Pumps with combination flanges are not permitted for operating pressures PN 16.**
- **The use of securing elements (e.g. spring lock washers) can result in leakages at the flange connection. They are therefore not permitted. The washers supplied (Fig. 3, item 1) must be inserted between screw heads/nut heads and the combination flange.**
- **The permissible tightening torques listed in the table below must not be exceeded, even if screws of higher strength (≥ 4.6) are used, since splintering may otherwise occur at the edges of the long holes. This may cause the screws to lose their prestress and leakage can occur in the flange connection.**
- **Use screws of sufficient length. The screw thread must project by at least one pitch of screw thread from the screw nut (Fig. 3, item 2).**

DN 40, 50, 65	Rated pressure PN 6	Rated pressure PN 10/16
Screw diameter	M12	M16
Strength class	≥ 4.6	≥ 4.6
Permitted tightening torque	40 Nm	95 Nm
Min. screw length for		
• DN 40	55 mm	60 mm
• DN 50/DN 65	60 mm	65 mm

DN 80	Rated pressure PN 6	Rated pressure PN 10/16
Screw diameter	M16	M16
Strength class	≥ 4.6	≥ 4.6
Permitted tightening torque	95 Nm	95 Nm
Min. screw length for		
• DN 80	70 mm	70 mm

- Install appropriate flat gaskets between pump and counter flanges.
- Tighten the flange bolts across diagonals in 2 steps to the prescribed tightening torque (see Table 7.1.2).
  - Step 1: 0.5 x permissible tightening torque
  - Step 2: 1.0 x permissible tightening torque
- Check the flange connections for impermeability.

- Single pump:
  Fit the two half-shells of the thermal insulation before commissioning and push them together so that the guide pins engage in the opposing holes.

7.2 Electrical connection

DANGER! Risk of fatal injury!
Improper electrical connections can lead to fatal electric shock.

- **Only allow the electrical connection and all associated activities to be carried out by an electrician approved by the local power supply company and in accordance with the local applicable regulations.**
- **Before working on the pump, all poles of the supply voltage must be disconnected. Due to the dangerous residual contact voltage (capacitors), no work may be commenced on the module until 5 minutes have elapsed (only to 1~ version). Check whether all connections (including potential-free contacts) are voltage-free.**
- **Do not operate the pump if the module/terminal box is damaged.**
- **If the setting and operating elements on the module/terminal box are improperly removed, there is a danger of electric shock by touching the electrical components located inside.**

CAUTION! Risk of material damage!
An incorrect electrical connection can cause material damage.
If the wrong voltage is applied, the motor can be damaged!

- The current type and voltage of the mains connection must correspond to the specifications on the rating plate.
- The electrical connection must be established via a fixed connection line equipped with a connector device or an all-pole switch with a contact opening width of at least 3 mm.
- Fuse on mains side: 10 A, slow.
- The pumps can also be used without limitation in existing installations with or without residual-current devices. When dimensioning the residual-current device, consider the number of pumps connected and their rated motor currents.
- When pumps are used in systems with water temperatures above 90 °C, a suitable heat-resistant connection cable must be used.
- All connection cables must be installed so that they do not touch the pipe and/or the pump or motor housing.
- In order to ensure drip protection and strain relief on the threaded cable connection (PG 13.5), a cable with an outer diameter of 10 – 12 mm should be used and mounted as shown in Fig. 5. In addition, the cable near the screwed connection should be bent into the form of a drip loop, from which any accumulated drip will fall. Unused threaded cable connections should be blanked off with the sealing plates provided, and screwed up tight.

- Commission pumps only if they are fitted with the correct modular cover. Check that the cover gasket is correctly seated.
- Earth the pump/installation as per regulations.

7.2.1 Motor protection

DANGER! Risk of fatal injury!
Improper electrical connections can lead to fatal electric shock.
If the mains and thermal winding contact (WSK) line are fed in a 5-wire cable, the thermal winding contact line is not allowed to be monitored with an extra-low voltage.

CAUTION! Risk of material damage!
If the thermal winding contact (WSK, terminal 10 and 15) of the pump is not connected to the motor protection, the motor might be damaged by thermal overload!

Pump with terminal box type		Tripping	SSM (collective fault signal)	Fault acknowledgement
1~ 230 V	1/2 (P_1max ≤ 205 W)	Internal interruption of motor voltage	–	Automatically, after the motor has cooled down
	3/4 (295 W ≤ P_1max ≤ 345 W)	WSK and external tripping unit (SK602(N)/ SK622(N) or other switchgear/control device)	–	After the motor on the SK602/ SK622 has cooled down: manually on the tripping unit on the SK602N/SK622N: automatically
	5 (295 W ≤ P_1max ≤ 345 W)	WSK and external tripping unit (SK602(N)/ SK622(N) or other switchgear/control device)	–	After the motor on the SK602/ SK622 has cooled down: manually on the tripping unit on the SK602N/SK622N: automatically
3~ 400 V	6 (P_1max ≤ 215 W)	Internal interruption of a motor phase	–	• Switch off mains voltage • Allow motor to cool down • Switch on mains voltage
	7 (305 W ≤ P_1max ≤ 1445 W)	WSK and external tripping unit (SK602(N)/ SK622(N) or other switchgear/control device)	–	After the motor on the SK602/ SK622 has cooled down: manually on the tripping unit on the SK602N/SK622N: automatically

- The setting of any thermal tripping fitted must correspond to the maximum current (see rating plate) of the speed stage at which the pump is being operated.

Motor protection tripping units
If Wilo tripping units SK602(N)/SK622(N) are present in existing systems, pumps with full motor protection (WSK) can be connected to them. Connect the mains supply and tripping unit (observe the rating plate information) as per the wiring diagrams (Fig. 7a and Fig. 7b) Fig. 7a:
1~ 230 V: 295 W ≤ P_1max ≤ 345 W, with thermal winding contact

7.2.2 Frequency converter operation

The three-phase motors of series TOP-Z can be connected to a frequency converter. When operating with frequency converters, output filters should be used to reduce noise and to avoid damage due to overvoltages.
For noise reduction, it is recommended that sine filters (LC filters) are used rather than du/dt filters (RC filters).
The following limit values should be complied with:

- Rate of voltage rise du/dt <500 V/µs
- Overvoltages û < 650 V

The following limit values at the connection terminals of the pump must not be exceeded:

- U_{min} = 150 V
- f_{min} = 30 Hz

At low output frequencies from the frequency converter, the direction of rotation signal lamp at the pump may go out.

8 Commissioning

WARNING! Risk of personal injury and material damage!
Commissioning the pump without the screw plug, including the flat gasket, is not allowed, since escaping fluid can cause damage!

Prior to commissioning the pump, check that it has been installed and connected correctly.

8.1 Priming and venting

Prime and vent the unit correctly. The pump rotor chamber is vented automatically after a short operating period. Dry running for short periods will not harm the pump.

WARNING! Risk of personal injury and material damage!
The motor head, the differential pressure screw (Fig. 3, item 3) or the flange connection/threaded pipe union are not allowed to be undone for the purpose of venting!

- **There is a risk of scalding!**
  Escaping fluid can lead to injuries to persons and material damage.
  When the venting screw is opened, hot fluid may escape or shoot out at high pressure in liquid or vapour form.

- **Touching the pump can cause burns!**
  Depending on the pump or system operating conditions (fluid temperature), the entire pump can get very hot.

  Pumps with venting screws (visible on the motor head; Fig. 1, item 1) can be vented, if required, as follows:
- Switch off the pump.
- Close the shut-off device on the pressure side.
- Protect electrical parts from any escaping water.
- Open venting screw (Fig. 1, item 1) carefully using a suitable tool.

CAUTION! Risk of material damage!
Depending on the operating pressure, the pump may jam when the venting screw is open.
The necessary inlet pressure must be present at the suction side of the pump!

- Carefully push back the motor shaft with a screwdriver several times.
- After 15 to 30 seconds, screw the venting screw back in.
- Switch on the pump.
- Open the shut-off device again.

NOTICE! Incomplete venting will lead to noises being produced in the pump and unit. Repeat the procedure if necessary.

8.2 Direction of rotation monitoring

- Direction of rotation monitoring for 3~:
  The direction of rotation is displayed, depending on the terminal box, by a light on or in the terminal box (Fig. 4, item 1). If the direction of rotation is correct, the light lights up green. If the direction of rotation is incorrect, the light remains dark. To check the direction of rotation, briefly switch the pump on. If the direction of rotation is incorrect, proceed as follows:
  - Electrically isolate the pump.
  - Interchange 2 phases in the terminal box.
  - Restart the pump.

  The direction of rotation of the motor must correspond to the direction of rotation arrow on the rating plate.

8.2.1 Variable speed control

DANGER! Risk of fatal injury!
When working on the open terminal box, there is a danger of electric shock from touching the live terminals.

- **Disconnect the system from the power and secure it against being switched on.**
- **It is not permissible to perform a stage change-over whilst in operation.**
- **Only qualified personnel may perform a step change-over.**

For 1~ pumps with terminal box type 1, 3 (Fig. 4):
Undo the fastening screws, then remove the terminal box cover, set the inner 3-stage-rotary switch (Fig. 4, item 3) to the symbol of the required speed stage in the terminal box and properly close the terminal cover.
When the terminal box cover is closed, the speed stage setting can be viewed through the viewing window.

For 1~ pumps with terminal box type 2, 4 (Fig. 4):

- Speed change-over in the terminal box:
  - Undo the fastening screws, then remove the terminal box cover, select the desired speed stage for the terminal box type 2/4 by changing over the cable jumpers, then correctly refit the terminal box cover.
- External speed change-over outside the terminal box (pumps with cable version):
  - A cable as per wiring diagram Fig. 7b can be connected for externally switching speed stages. Undo the fastening screws, then remove the terminal box cover, remove the cable jumpers, feed in the cable through the PG cable gland and connect it, then correctly refit the terminal box cover. The cable end should be connected to an external 3-speed selector.

NOTICE! If the cable jumpers are not connected or incorrectly connected, the pump will not start. Produce connection according to terminal box 2/4 or wiring diagram Fig. 7b.

For 1~ and 3~ pumps with terminal box type 5, 6, 7 (Fig. 4):
The switching plug in the terminal box can be set to a maximum two or three stages (depending on the terminal box type).
Undo the fastening screws, then remove the terminal box cover, remove the switching plug (Fig. 4, item 3) only when the pump is switched off and re-insert so that the symbol of the required speed stage in the terminal box is shown by the corresponding marking of the switching plug.
When the terminal box cover is closed, the speed stage setting can be viewed through the viewing window.

8.3 Decommissioning

The pump must be decommissioned before carrying out maintenance, repair or dismantling work.

DANGER! Risk of fatal injury!
There is a risk of fatal injury from electric shock when working on electrical devices.

- **Have work on the electrical part of the pump carried out strictly only by a qualified electrician.**

- **Before starting any maintenance and repair work, disconnect the pump from the power supply, and make sure it cannot be switched back on by unauthorised persons.**

WARNING! Risk of burn!
Depending on the pump or system operating conditions (fluid temperature), the entire pump can get very hot. Touching the pump can cause burns. Allow the system and pump to cool to room temperature.

9 Maintenance

Before carrying out maintenance / cleaning and repair work, read sections "Dismantling/installation of the motor" and "Decommissioning". The safety instructions in sections 2.6, 7 and 8 must be followed.
After maintenance and repair work, install and connect the pump as described in the section "Installation and electrical connection". Switch on the machine as described in the "Commissioning" section.

9.1 Dismantling/installation of the motor

WARNING! Risk of injury.

- **Touching the pump can cause burns!**
  Depending on the pump or system operating conditions (fluid temperature), the entire pump can get very hot.
- **At high fluid temperatures and system pressures there is the risk of scalding from escaping hot fluid.**
  Before dismantling the motor, close the existing shut-off devices on both sides of the pump, allow the pump to cool to room temperature, and drain the isolated branch of the system. If no shut-off devices are fitted, drain the system.
- **Risk of injury from the motor falling when the fastening screws have been undone.**
  Comply with national regulations for accident prevention and also with the operator's internal work, company and safety regulations. If necessary, wear protective clothing and equipment!
- **During installation/dismantling of the motor head, the rotor unit can fall out and injure personnel. Do not hold the motor head with the impeller facing downward.**

The motor does not have to be completely removed from the pump housing if only the terminal box is to be repositioned. The motor can be rotated to the desired position whilst still attached to the pump housing (see Fig. 2 for the permitted installation positions).

CAUTION! Risk of material damage!
If for maintenance or repair work the motor head is detached from the pump housing, the O-ring located between the motor head and pump housing must be replaced with a new one. Care must be taken to position the O-ring correctly when installing the motor head.

- To release the motor, undo the 4 internal hexagon head screws.

CAUTION! Risk of material damage!
Do not damage the O-ring located between the motor head and the pump housing. The O-ring must lie in the angled end of the bearing plate that faces the impeller, and must not be twisted.

- After the installation, tighten the 4 internal hexagon head screws again crosswise.
- For the commissioning of the pump, see section 8.

10 Faults, causes and remedies

Have faults remedied by qualified personnel only!
Observe the safety instructions in section 9!

Fault	Cause	Remedies
The system is making noises.	Air in the system.	Vent the system.
	The flow rate at the pump is too high.	Reduce the pump power by switching to a lower speed.
	The pump delivery head is too high.	Reduce the pump power by switching to a lower speed.
Pump is making noises.	Cavitation due to insufficient inlet pressure.	Check pressure stability / supply pressure and, if necessary, increase them within the permissible range.
	Foreign bodies in the pump housing or impeller.	After dismantling the motor impeller unit, remove the foreign body.
	Air within the pump.	Vent the pump/system.
	The shut-off devices in the system are not fully open.	Fully open the shut-off devices.
The pump power is too low.	Foreign bodies in the pump housing or impeller.	After dismantling the motor impeller unit, remove the foreign body.
	Incorrect flow direction.	Interchange the pressure side and suction side of the pump. Refer to the direction of flow symbol on the pump housing or pump flange.
	The shut-off devices in the system are not fully open.	Fully open the shut-off devices.

Fault	Cause	Remedies
	Incorrect direction of rotation.	Correct the electrical connections in the terminal box: Refer to the direction of rotation arrow on the rating plate
	(only for 3~) terminal box type 6/7:	
	Signal lamp off	Interchange two phases at the mains supply terminals.
With the power switched on, the pump does not run	Fuse protection tripped / defective.	Exchange / switch on the fuse protection. If the fuse protection trips again: • Check the pump for electrical defects. • Check the mains cable to the pump and check the electrical connections.
	Residual-current device has tripped.	Switch on the residual-current device. If the residual-current device trips again: • Check the pump for electrical defects. • Check the mains cable to the pump and check the electrical connections.
	Undervoltage	Check the voltage at the pump (refer to the rating plate).
	Damage to the windings	Contact customer service.
	Terminal box defective.	Contact customer service.
	Capacitor defective (only for 1~). Terminal box type 1/2/3/4/5	Replace the capacitor.
	Cable jumper for speed change-over not fitted/ wrongly fitted. Terminal box type 2/4	Correctly install the cable jumper, see Fig. 4/7b
	Speed selection plug is not fitted. Terminal box type 5/6/7	Fit the speed selection plug.

Fault	With the power switched on, the pump does not run.						
Cause	**Motor protection has switched the pump off, because:**						
	a) Switch off because of hydraulic overloading of the pump.	**b)** Switch off because of obstruction within the pump.		**c)** Switch off because of excessive fluid temperature.		**d)** Switch off because of excessive ambient temperature.	
Remedies	**a)** Throttle the pump on the pressure side to an duty point on the pump curve.	**b)** If necessary remove the venting screw (visible from outside) from the pump and check the free running of the pump rotor by turning the slotted shaft end, using a screwdriver; unblock if necessary. **Alternative:** Dismantle the motor head and check; if necessary, unblock by turning the impeller. If the obstruction cannot be cleared, contact customer service.		**c)** Reduce the temperature of the fluid, see rating plate data.		**d)** Reduce the ambient temperature , e.g. by insulating the piping and valves.	
Display	Display of the lights in the terminal box type						
		1	2	3	4	5	6	7
		–	–	–	–	green	green	green
Fault acknowledgement	**Terminal box type 1/2:** Auto-reset; after the motor has cooled down, the pump restarts automatically.						
	Terminal box type 3/4/5/7: It the thermal winding contact was connected to an external switchgear SK602/SK622, this must be reset. For switchgear SK602N/SK622N the fault is automatically acknowledged once the motor has cooled.						
	Terminal box type 6: After the motor protection has tripped, switch off the mains voltage. Allow the pump to cool down approx. 8 to 10 min, then switch the supply voltage on again.						

If the malfunction cannot be rectified, consult a specialist technician or the nearest customer service centre or Wilo representative office.

11 Spare parts

Spare parts may be ordered via local professional technicians and/or Wilo customer service.

To avoid queries and incorrect orders, all data from the rating plate must be specified with every order.

12 Disposal

Proper disposal and recycling of this product prevents damage to the environment and risks to personal health.

1. When disposing of all or part of the product, use public or private disposal companies.
2. For more information on proper disposal, please contact your local council or waste disposal office or the supplier from which the product was purchased.

NOTICE: The pump must not be disposed of along with household waste!
For further information on recycling, visit
www.wilo-recycling.com

Subject to change without prior notice!

DE **EG – Konformitätserklärung**
EN ***EC – Declaration of conformity***
FR ***Déclaration de conformité CE***

(gemäß 2006/42/EG Anhang II,1A und2004/108/EG Anhang IV,2,
according 2006/42/EC annex II,1A and2004/108/EC annex IV,2,
conforme 2006/42/CE appendice II,1A et 2004/108/CE appendice IV,2)

Hiermit erklären wir, dass die Nassläufer-Umwälzpumpen der Baureihe : **TOP-Z**
Herewith, we declare that the glandless circulating pumps of the series:
Par le présent, nous déclarons que les circulateurs des séries :

(Die Seriennummer ist auf dem Typenschild des Produktes nach Punkten b) & c) von §1.7.4.2 und §1.7.3 des Anhanges I der Maschinenrichtlinie 2006/42/EG angegeben. / *The serial number is marked on the product site plate according to points b) & c) of §1.7.4.2 and §1.7.3 of the annex I of the machinery directive 2006/42/EC. / Le numéro de série est inscrit sur la plaque signalétique du produit en accord avec les points b) & c) du §1.7.4.2 et du §1.7.3 de l'annexe I de la Directive Machines 2006/42/CE.)*

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:
in their delivered state complies with the following relevant provisions:
sont conformes aux dispositions suivantes dont isl relèvent:

EG-Maschinenrichtlinie **2006/42/EG**
EC-Machinery directive
Directives CE relatives aux machines

Die Schutzziele der Niederspannungsrichtlinie 2006/95/EG werden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG eingehalten / *The protection objectives of the low-voltage directive* 2006/95/EC *are realized according annex I, No. 1.5.1 of the EC-Machinery directive 2006/42/EC / Les objectifs protection de la directive basse-tension* 2006/95/CE *sont respectées conformément à appendice I, n° 1.5.1 de la directive CE relatives aux machines 2006/42/CE.*

Elektromagnetische Verträglichkeit - Richtlinie **2004/108/EG**
Electromagnetic compatibility - directive
Compatibilité électromagnétique- directive

und entsprechender nationaler Gesetzgebung,
and with the relevant national legislation,
et aux législations nationales les transposant,

angewendete harmonisierte Normen, insbesondere: **EN 809+A1**
as well as following harmonized standards: **EN 12100**
ainsi qu'aux normes harmonisées suivantes: **EN 60335-2-51**

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen ist:
Authorized representative for the completion of the technical documentation:
Mandataire pour le complément de la documentation technique est :

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Dortmund, 04.01.2013

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CE-AS-Sh. Nr. 4119643

NL

EG-verklaring van overeenstemming

Hiermede verklaren wij dat dit aggregaat in de geleverde uitvoering voldoet aan de volgende bepalingen:

EG-richtlijnen betreffende machines 2006/42/EG

Elektromagnetische compatibiliteit 2004/108/EG

gebruikte geharmoniseerde normen, in het bijzonder:

zie vorige pagina

IT

Dichiarazione di conformità CE

Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti:

Direttiva macchine 2006/42/EG

Compatibilità elettromagnetica 2004/108/EG

norme armonizzate applicate, in particolare:

vedi pagina precedente

ES

Declaración de conformidad CE

Por la presente declaramos la conformidad del producto en su estado de suministro con las disposiciones pertinentes siguientes:

Directiva sobre máquinas 2006/42/EG

Directiva sobre compatibilidad electromagnética 2004/108/EG

normas armonizadas adoptadas, especialmente:

véase página anterior

PT

Declaração de Conformidade CE

Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos:

Directivas CEE relativas a máquinas 2006/42/EG

Compatibilidade electromagnética 2004/108/EG

normas harmonizadas aplicadas, especialmente:

ver página anterior

SV

CE- försäkran

Härmed förklarar vi att denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser:

EG–Maskindirektiv 2006/42/EG

EG–Elektromagnetisk kompatibilitet – riktlinje 2004/108/EG

tillämpade harmoniserade normer, i synnerhet:

se föregående sida

NO

EU-Overensstemmelseserklæring

Vi erklærer hermed at denne enheten i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser:

EG–Maskindirektiv 2006/42/EG

EG–EMV–Elektromagnetisk kompatibilitet 2004/108/EG

anvendte harmoniserte standarder, særlig:

se forrige side

FI

CE-standardinmukaisuusseloste

Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä:

EU–konedirektiivit: 2006/42/EG

Sähkömagneettinen soveltuvuus 2004/108/EG

käytetyt yhteensovitetut standardit, erityisesti:

katso edellinen sivu.

DA

EF-overensstemmelseserklæring

Vi erklærer hermed, at denne enhed ved levering overholder følgende relevante bestemmelser:

EU–maskindirektiver 2006/42/EG

Elektromagnetisk kompatibilitet: 2004/108/EG

anvendte harmoniserede standarder, særligt:

se forrige side

HU

EK-megfelelőségi nyilatkozat

Ezennel kijelentjük, hogy az berendezés megfelel az alábbi irányelveknek:

Gépek irányelv: 2006/42/EK

Elektromágneses összeférhetőség irányelv: 2004/108/EK

alkalmazott harmonizált szabványoknak, különösen:

lásd az előző oldalt

CS

Prohlášení o shodě ES

Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením:

Směrnice ES pro strojní zařízení 2006/42/ES

Směrnice o elektromagnetické kompatibilitě 2004/108/ES

použité harmonizační normy, zejména:

viz předchozí strana

PL

Deklaracja Zgodności WE

Niniejszym deklarujemy z pełną odpowiedzialnością, że dostarczony wyrób jest zgodny z następującymi dokumentami:

dyrektywą maszynową WE 2006/42/WE

dyrektywą dot. kompatybilności elektromagnetycznej 2004/108/WE

stosowanymi normami zharmonizowanymi, a w szczególności:

patrz poprzednia strona

RU

Декларация о соответствии Европейским нормам

Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам:

Директивы ЕС в отношении машин 2006/42/EG

Электромагнитная устойчивость 2004/108/EG

Используемые согласованные стандарты и нормы, в частности :

см. предыдущую страницу

EL

Δήλωση συμμόρφωσης της ΕΕ

Δηλώνουμε ότι το προϊόν αυτό σ' αυτή την κατάσταση παράδοσης ικανοποιεί τις ακόλουθες διατάξεις :

Οδηγίες ΕΚ για μηχανήματα 2006/42/ΕΚ

Ηλεκτρομαγνητική συμβατότητα ΕΚ-2004/108/ΕΚ

Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα:

Βλέπε προηγούμενη σελίδα

TR

CE Uygunluk Teyid Belgesi

Bu cihazın teslim edildiği şekliyle aşağıdaki standartlara uygun olduğunu teyid ederiz:

AB-Makina Standartları 2006/42/EG

Elektromanyetik Uyumluluk 2004/108/EG

kısmen kullanılan standartlar için:

bkz. bir önceki sayfa

RO

EC-Declaraţie de conformitate

Prin prezenta declarăm că acest produs aşa cum este livrat, corespunde cu următoarele prevederi aplicabile:

Directiva CE pentru maşini 2006/42/EG

Compatibilitatea electromagnetică – directiva 2004/108/EG

standarde armonizate aplicate, îndeosebi:

vezi pagina precedentă

ET

EÜ vastavusdeklaratsioon

Käesolevaga tõendame, et see toode vastab järgmistele asjakohastele direktiividele:

Masinadirektiiv 2006/42/EÜ

Elektromagnetilise ühilduvuse direktiiv 2004/108/EÜ

kohaldatud harmoneeritud standardid, eriti:

vt eelmist lk

LV

EC – atbilstības deklarācija

Ar šo mēs apliecinām, ka šis izstrādājums atbilst sekojošiem noteikumiem:

Mašīnu direktīva 2006/42/EK

Elektromagnētiskās savietojamības direktīva 2004/108/EK

piemēroti harmonizēti standarti, tai skaitā:

skatīt iepriekšējo lappusi

LT

EB atitikties deklaracija

Šiuo pažymima, kad šis gaminys atitinka šias normas ir direktyvas:

Mašinų direktyvą 2006/42/EB

Elektromagnetinio suderinamumo direktyvą 2004/108/EB

pritaikytus vieningus standartus, o būtent:

žr. ankstesniame puslapyje

SK

ES vyhlásenie o zhode

Týmto vyhlasujeme, že konštrukcie tejto konštrukčnej série v dodanom vyhotovení vyhovujú nasledujúcim príslušným ustanoveniam:

Stroje - smernica 2006/42/ES

Elektromagnetická zhoda - smernica 2004/108/ES

používané harmonizované normy, najmä:

pozri predchádzajúcu stranu

SL

ES – izjava o skladnosti

Izjavljamo, da dobavljene vrste izvedbe te serije ustrezajo sledečim zadevnim določilom:

Direktiva o strojih 2006/42/ES

Direktiva o elektromagnetni združljivosti 2004/108/ES

uporabljeni harmonizirani standardi, predvsem:

glejte prejšnjo stran

BG

ЕО-Декларация за съответствие

Декларираме, че продуктът отговаря на следните изисквания:

Машинна директива 2006/42/ЕО

Електромагнитна съвместимост – директива 2004/108/ЕО

Хармонизирани стандарти:

вж. предната страница

MT

Dikjarazzjoni ta' konformità KE

B'dan il-mezz, niddikjaraw li l-prodotti tas-serje jissodisfaw id-dispożizzjonijiet relevanti li ġejjin:

Makkinarju - Direttiva 2006/42/KE

Kompatibbiltà elettromanjetika - Direttiva 2004/108/KE

b'mod partikolari:

ara l-paġna ta' qabel

HR

EZ izjava o sukladnosti

Ovim izjavljujemo da vrste konstrukcije serije u isporučenoj izvedbi odgovaraju sljedećim važećim propisima:

EZ smjernica o strojevima 2006/42/EZ

Elektromagnetna kompatibilnost - smjernica 2004/108/EZ

primijenjene harmonizirane norme, posebno:

vidjeti prethodnu stranicu

SR

EZ izjava o usklađenosti

Ovim izjavljujemo da vrste konstrukcije serije u isporučenoj verziji odgovaraju sledećim važećim propisima:

EZ direktiva za mašine 2006/42/EZ

Elektromagnetna kompatibilnost - direktiva 2004/108/EZ

primenjeni harmonizovani standardi, a posebno:

vidi prethodnu stranu

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